MAIL STOP APPEAL BRIEF-PATENTS
PATENT
0600-1031

IN THE U.S. PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of	Appeal No.
Jean-Jacques CABOCHE et al.	Conf. 5740
Application No. 10/030,002	Group 1615
Filed March 19, 2002	Examiner Isis A.D. Ghali

SOLUBLE BRANCHED POLYMERS OF GLUCOSE AND PROCESS FOR PRODUCTION THEREOF

APPEAL BRIEF

MAY IT PLEASE YOUR HONORS:

(i) **Real Party in Interest**

The real party in interest in this appeal is the assignee, ROQUETTE FRERES of Lestrem, France.

(ii) **Related Appeals and Interferences**

None.

(iii) **Status of Claims**

Claims 19-24 and 31-37 are pending in the application, and this appeal is taken from the final rejection of all the pending claims.

(iv) **Status of Amendments**

No amendment was filed subsequent to the final rejection on appeal.

(v) **Summary of Claimed Subject Matter**

Claims 19 and 31 are the independent claims on appeal.

Claim 19 reflects the discovery of a novel process for making soluble branched polymers of glucose containing essentially no β-glucosidic bonds. The process involves subjecting an aqueous solution of starch or a starch derivative (of 1 to 50% by weight dry matter) to a temperature greater than 130°C, and a pressure of more than 3.5 bars, for 2 to 5 minutes (page 14, lines 5-10). The resulting starch or starch derivative is treated with 50 to 2,000 units of purified branching enzyme at a temperature between 25 and 50°C for 10 minutes to 24 hours (page 14, lines 13-16), and the branched polymers of glucose thus obtained are collected (page 14, lines 17-20).

Claim 31 recites the product polymer. In particular, that claim is directed to a soluble branched polymer of glucose containing essentially no β-glucosidic bonds and having between 2.5 and 10% of α-1,6 glucosidic bonds (page 7, line 18), a low or zero tendency to retrograde in aqueous solution as determined according to a test A (page 7, lines 20-25 and page 8, lines 19-28), a Mw determined according to a test C at a median value of the molecular weight distribution profile lying between 10^4 and 10^8 daltons (page 7, lines 20-25), and a reducing sugar content of at most 9% (page 7, lines 24-30); and wherein the polymer is in an isolated and purified form (page 15, lines 1-3 and page 18, lines 1-14).

The present inventors have unexpectedly and surprisingly discovered that the claimed glucose polymers exhibit excellent stability as evidenced by their low tendency to retrograde and ability to maintain viscosity over a prolonged time period. (page 9, line 28 to page 10, line 4; Example 2; and pg. 13, line 19-25).

(vi) **Ground of Rejection to be Reviewed on Appeal**

The sole issue on appeal is whether claims 19-24 and 31-37 would have been obvious in view of U.S. Patent No. 4,454,161 ('161) considered alone.

(vii) **Arguments**

The '161 patent relates to a process for obtaining an amylaceous reaction product some of whose α-1,4-linakges are enzymatically converted to α-1,6-linkages" (col. 1, lines 64-68). The '161 patent discloses that a solution of the amylaceous substance, already gelatinized and dispersed, may be treated directly with a branching enzyme (col. 2, lines 5-20). Alternatively, the amylaceous substance is heated in the presence of the branching enzyme to effect gelatinization and enzymatic reaction simultaneously (col. 2, lines 5-20).

(a) The '161 Patent Would Not Have Rendered Obvious Method Claims 19-24

The '161 patent does not render obvious treating a starch or starch derivative under the conditions recited in steps a) or b) of independent claim 19.

In step a), the recited starch or starch derivatives are subjected to a relatively high temperature and pressure for a relatively short duration. This stands in contrast to the conventional gelatinization conditions utilized by the '161 patent. Conventional gelatinization conditions use milder conditions than those recited in step a) of claim 19. For example, to gelatinize waxy maize starch, the temperature is generally kept below 92° Celsius, the pressure is typically atmospheric, and the temperature is slowly raised to progressively reach the gelatinization temperature of the starch.

Although Example B-4 of the '161 patent utilizes a heating step of between 140°C to 145°C, the amylaceous substance (i.e., wheat flour) is heated in the presence of the branching enzyme to effect the gelatinization and enzymatic reactions simultaneously. In other words, Example B-4 enzymatically treats the amylaceous substance at a temperature almost three times greater than that recited in claimed step b) (i.e., between 25 and 50°C).

The Final Rejection acknowledges on page 4 that the '161 patent does not teach the claimed time or pressure

parameters. Rather, the Final Rejection states that these parameters do not impart patentability to the claimed invention. However, a particular parameter or variable must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the parameter or variable might be characterized as routine or obvious. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). As the '161 patent is silent as to time and pressure parameters, it is believed that it has not been established that the claimed time and pressure parameters would have been recognized as result-effective variables.

In view of the above, it is believed to be apparent that the '161 Patent does not disclose steps a) or b), and, furthermore, that on the present record one skilled in the art would have had no apparent reason to modify the '161 patent to obtain the claimed invention.

b) The '161 Patent Would Not Have Rendered Obvious Composition Claims 31-37

As the '161 patent teaches a method that is distinct from that of the present invention, it follows that the '161 patent does not necessarily produce a composition that is the same as that recited in claims 31-37, a point which is tacitly

acknowledged by the application of an obviousness rather than anticipation rejection.

In particular, there is no disclosure in the '161 patent, either express or inherent, of a composition having the recited amount of α-1,6 glucosidic bonds or the 1,6 molecular weight distribution as recited in independent claim 31. Nevertheless, the final rejection maintains that it would have been expected that the '161 product would have the same features as the claimed soluble branched polymers of glucose without providing any evidence or technical reasoning that establishes that these differences would have necessarily been present in the '161 product.

As the final rejection of the composition claims fails to address the differences between the claimed composition and the disclosure of the '161 patent, the final rejection as a matter of law fails to establish why these differences are such that the composition claims taken as a whole would have been obvious to the skilled artisan.

Thus, the '161 patent does not render obvious claims 31-37.

Conclusion

From the foregoing discussion, it is believed to be apparent that the rejections of claims 19-24 and 31-37 are improper and should be reversed. Such action is accordingly respectfully requested.

(viii) **Claims Appendix**

A copy of the claims involved in the appeal is attached.

(ix) **Evidence Appendix**

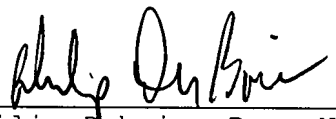
None.

(x) **Related Proceedings Appendix**

None.

Respectfully submitted,

YOUNG & THOMPSON



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(viii) **Claims Appendix**

The claims on appeal are:

19. A process for manufacture of soluble branched polymers of glucose essentially containing no β-glucosidic bonds, wherein:

a) an aqueous solution of starch or of starch derivative of dry matter of 1 to 50% by weight, is subjected to a temperature greater than 130°C, under a pressure of more than 3.5 bars, for 2 to 5 mins,

b) the starch or starch derivative thus obtained is treated with 50 to 2,000 units of purified branching enzyme at a temperature lying between 25 and 50°C for a duration from 10 mins to 24 hrs, and

c) the branched polymers of glucose thus obtained are collected.

20. The process for manufacture of soluble branched polymers of glucose essentially containing no β-glucosidic bonds according to Claim 19, wherein:

a) an aqueous solution of starch or of starch derivative of dry matter of 1 to 50% by weight is subjected to a temperature lying between 140 and 150°C, under a pressure lying between 4 and 5 bars, for 2 to 5 mins,

b) the starch or starch derivative thus obtained is treated with 50 to 2,000 units of purified branching enzyme at a temperature of 30°C, for a duration from 10 mins to 24 hrs, and

c) the branched polymers of glucose thus obtained are collected.

21. The process for manufacture of soluble branched polymers of glucose according to Claim 19, wherein the branching enzyme is selected from the group consisting of glycogen branching enzymes, starch branching enzymes and any mixtures of these enzymes.

22. The process for manufacture of soluble branched polymers of glucose according to Claim 19, wherein the branching enzyme is extracted from organisms and/or from microorganisms selected from the group consisting of higher plants, yeasts, bacteria and unicellular algae.

23. The process for manufacture of soluble branched polymers of glucose according to Claim 19, wherein the branching enzyme is extracted unicellular algae.

24. The process for manufacture of soluble branched polymers of glucose according to Claim 23, wherein the branching enzyme extracted from algae is obtained by isolation from a genetically modified organism capable of expressing the said enzyme.

31. Soluble branched polymers of glucose containing essentially no β-glucosidic bonds and having:

- between 2.5 and 10% of α-1, 6 glucosidic bonds,

- a very low or zero tendency to retrograde in aqueous solution, determined according to a test A,

- a Mw determined according to a test C at a median value of the molecular weight distribution profile lying between 10^4 and 10^8 daltons, and

- a reducing sugar content of at most 9%;

said polymers being in isolated and purified form.

32. The soluble branched polymers of glucose according to claim 31, wherein said soluble branched polymers of glucose have between 2.5 and 5% of α-1, 6 glucosidic bonds.

33. The soluble branched polymers of glucose according to claim 31, wherein said soluble branched polymers of glucose have a reducing sugar content of at most 1%.

34. Soluble branched polymers of glucose containing essentially no β-glucosidic bonds obtained according to the process of claim 31, having:

- between 2.5 and 10% of α-1, 6 glucosidic bonds,

- a very low or zero tendency to retrograde in aqueous solution, determined according to test A,

- a Mw determined according to a test C at a median value of the molecular weight distribution profile lying between 10^4 and 10^8 daltons, and

- a reducing sugar content of at most 9%.

35. (new) Soluble branched polymers of glucose according to claim 31, having a viscosity determined according to a test B of at most 5,000 cP.

36. Soluble branched polymers of glucose according to claim 31, having:

- between 2.5 and 5% of α-1, 6 glucosidic bonds,

- a Mw determined according to a test C at a median value of the molecular weight distribution profile lying between 10^5 and 10^6 daltons, and

- a reducing sugar content of at most 1%.

37. Soluble branched polymers of glucose according to claim 31, having:

- between 5 and 10% of α-1, 6 glucosidic bonds,

- a Mw determined according to a test C at a median value of the molecular weight distribution profile lying between 10^7 and 10^8 daltons, and

- a reducing sugar content of at most 1%.

(ix) **Evidence Appendix**

None.

(x) **Related Proceedings Appendix**

None.